

# Standard Actuator

MADE IN ITALY 



**GIUGIARO**  
DESIGN



# ACTUATECH

ACTUATOR TECHNOLOGY

# Actuatech Pneumatic Actuator

## Actuator Performances

- Special scotch yoke design that gives an increased torque and the seat break out point.
- Bush steel alloy and Scotch yoke steel alloy: use of steel parts instead of aluminium parts, ensures high wear resistance to the internal mechanism and consequent longer working life.
- Compact design with reduced overall dimension allows an easy handling & minimal air (energy) consumption.
- Special compound seals and guide on the sliding pistons, ensure self lubrication for life.
- The special double on one sealing rings grants a longer life maintenance free without O-ring sticking and replacement.
- Internal bores are fine lapped and have anodized surface treatment for lower friction and perfect piston sealing, this solution increases the life of the sliding parts.
- Maintenance free for the full actuator working life.
- Standard stainless steel drive shaft protects against the environmental corrosion.
- Shaft anti-blowing system. The driving shaft/lever construction avoids any possible expulsion of the shaft.
- Standard stroke adjustment.
- ATEX 94/9/CE for suitability of the equipment intended for the use in Potentially Explosive Atmosphere.

**Actuator Nominal Torque:** from 8 Nm to 1920 Nm.

**Mounting flange** according with DIN/ISO 5211, DIN 3337: F03 - F04 - F05 - F07 - F10 - F12 - F14 - F16.

**NAMUR standard pressure connection.**

**Rotation angle:** 92° (-1°+91°).

**Stroke Adjustment:** 10°. (Special adjustment on request).

**Nominal pressure:** 5,6 bar; maximum operating pressure 8,4 bar.

The torque is directly proportional to the operating pressure.

For the simple acting (spring return) actuators the reverse torque is performed only by the spring action, and is independent from the operating pressure.

**Temperature:** from -20°C to +80°C.

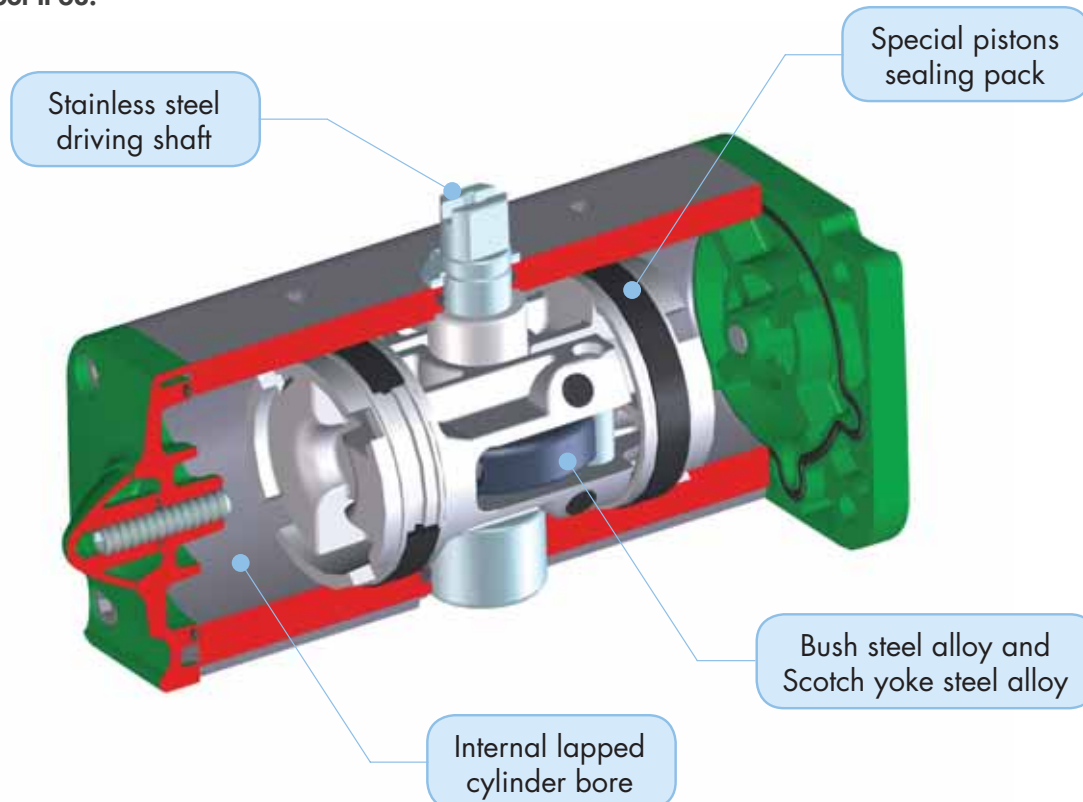
(Special version HT -20°C to +150°C or LT -50°C to +60°C).

**Operating media:** compress filtered air not necessarily lubricated. (For temperature under 0°C use dry air).

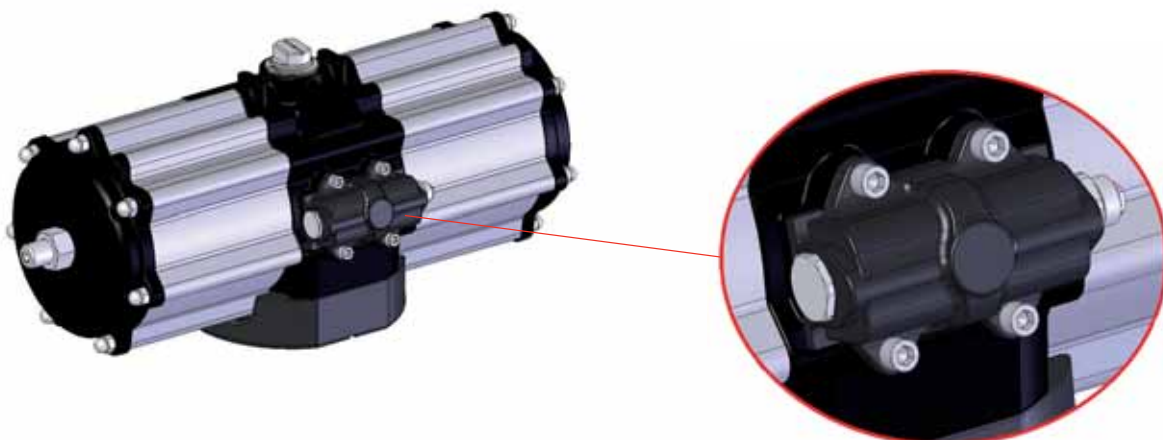
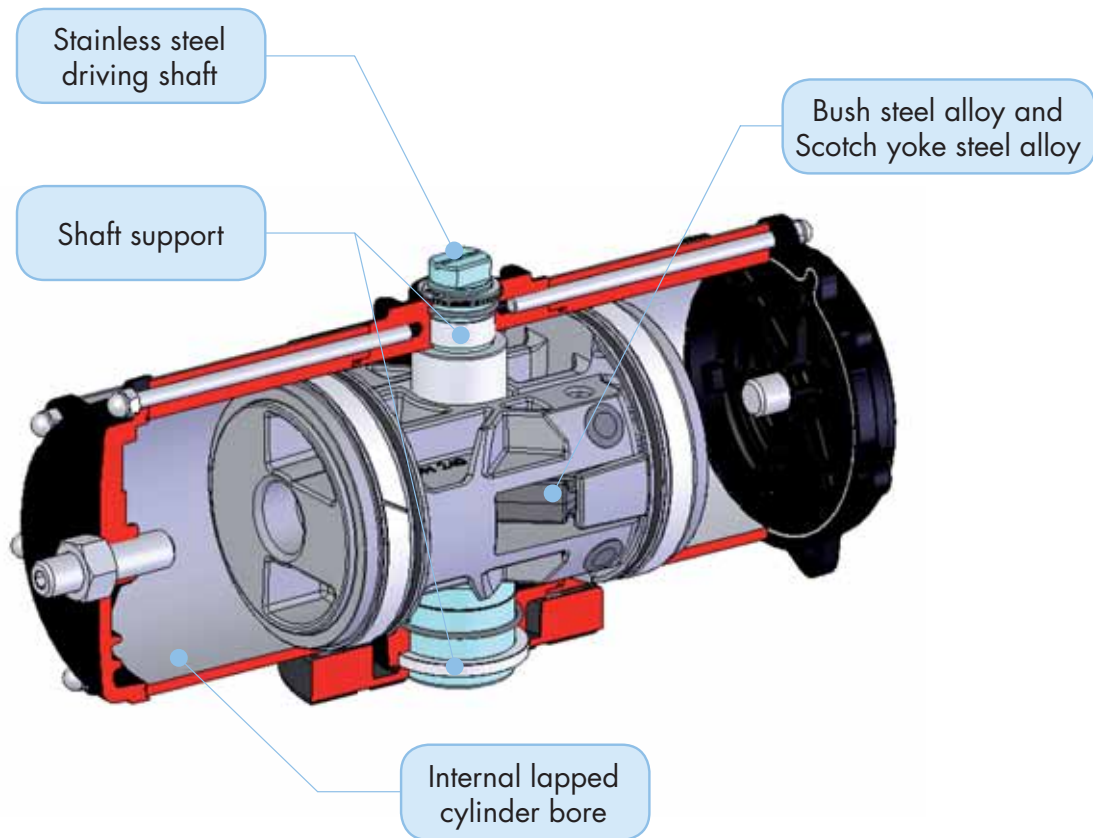
In case of lubricated air use non-detergent oil compatible with NBR rubber.

All the models are available in double acting "GD" and simple acting "GS" version.

**Water proof IP68.**



**Actuators Nominal Torque:** from 1440 Nm to 8000 Nm.  
**Mounting flange** according with DIN/ISO 5211, DIN 3337: F16 - F25.  
**NAMUR standard pressure connection.**  
**Rotation angle:** 100° (-5°+95°).  
**Stroke Adjustment:** 10°.  
**Nominal pressure:** 5,6 bar; maximum operating pressure 8,4 bar. (GD8000 pmax 7 bar).



# Scotch Yoke System: a technical choice

**F<sub>p</sub>** = Motive energy force, due to compressed air on pistons

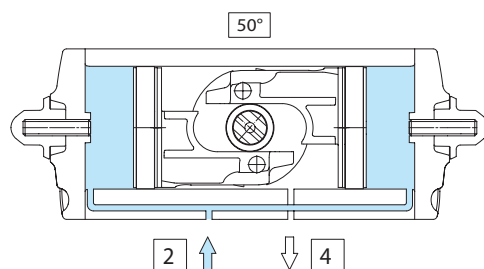
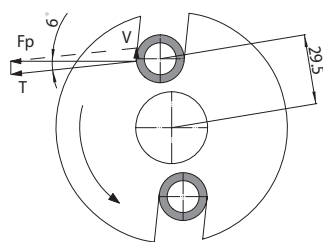
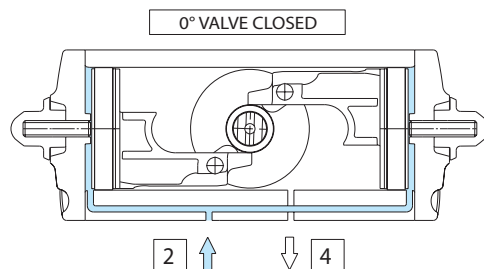
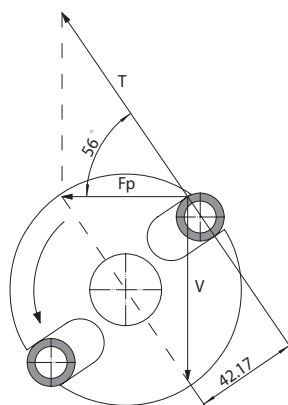
**M<sub>t</sub>** = Drive torque, force F<sub>p</sub> multiplied to its arm of application

**P** = Motive energy pressure

**T** = Tangential force of F<sub>p</sub>, rotation force

**V** = Perpendicular force of F<sub>p</sub>, discharged on the shaft

**D** = Piston diameter, actuator bore

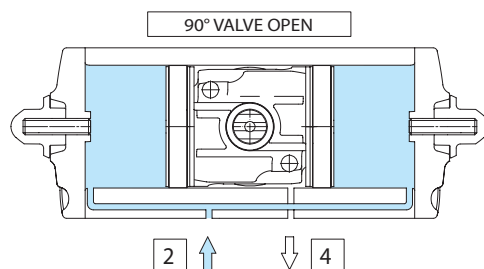
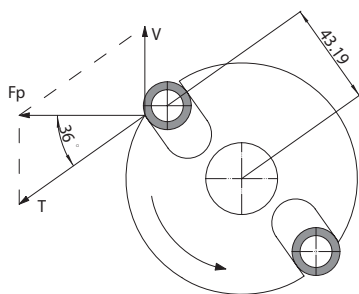


Calculation data:

**D** = 100 mm

**P** = 5.6 bar = 0.56 N/mm<sup>2</sup>

**F<sub>p</sub>** =  $(\pi D^2) P/4 = 4398 \text{ N}$



## Torque calculation example.

Taking in consideration the pneumatic actuator Actuotech GD480, we calculate the drive torque corresponding to 3 main drive shaft position rotation angle:

0° Valve Closed = Break torque, 50° Intermediate Position = Minimum Run torque, 90° Valve Open = End torque.

Valve Closed 0° = Break torque:  $Mt_b = 2 * (Fp / \cos(56^\circ)) * 42,17 = 663.326 \text{ Nmm} = 663 \text{ Nm}$

Intermediate Position 50° = Minimum Run torque:  $Mt_r = 2 * (Fp / \cos(6^\circ)) * 29,5 = 260911 \text{ Nmm} = 261 \text{ Nm}$

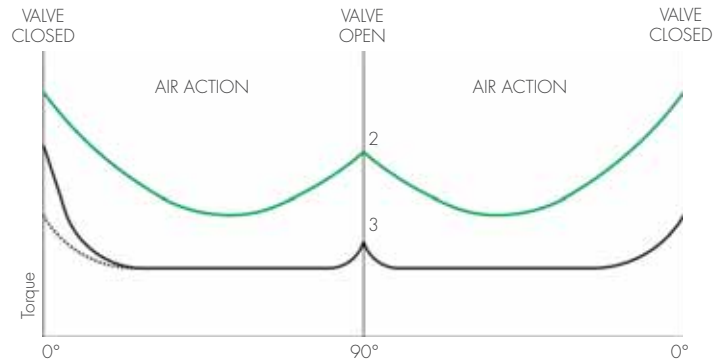
Valve Open 90° = End torque:  $Mt_e = 2 * (Fp / \cos(36^\circ)) * 43,19 = 469581 \text{ Nmm} = 469 \text{ Nm}$

**N.B.** The force **V** is not involved in the torque calculation as its direction is perpendicular to the drive shaft also, its action is annulled by means of the shaft and cylinder strength. The rotating torque is related only to the force **T** and its distance from the rotation axis.

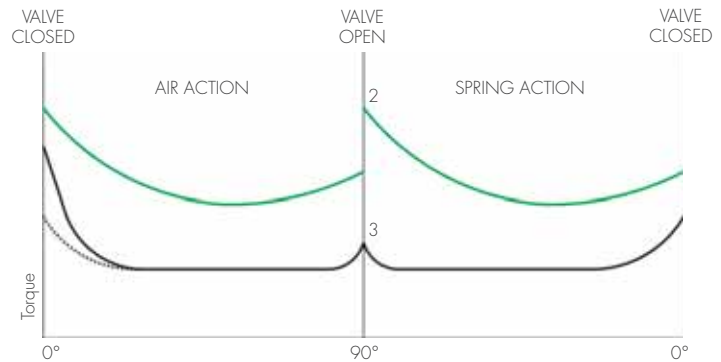
The calculated torques **Mt** are theoretical, the real torque must take in consideration the frictions in play and consequent **Scotch Yoke System Efficiency**. The friction of the system varies during the rotation as follows: positions 0° e 90° about 0,74÷0,76 (due to high transversal forces) position at 50° about 0,92 (low transversal force).

## Valve and actuator torques diagrams

Actuatech Scotch Yoke 5° Off-Set transforms the motive energy supplied to the pistons in a Canted rotary torque with an high start torque, a lower run torque and a final increased closing torque. This canted torque matches the part turn valves torque requirement (such as ball and butterfly valves) that has a similar torque development curve during its cycle.



The canted Scotch Yoke Spring Return Actuator sealing torque increase ensures a positive valve closing with its final push. Simple acting (spring return) actuators are available also in fail to open version.



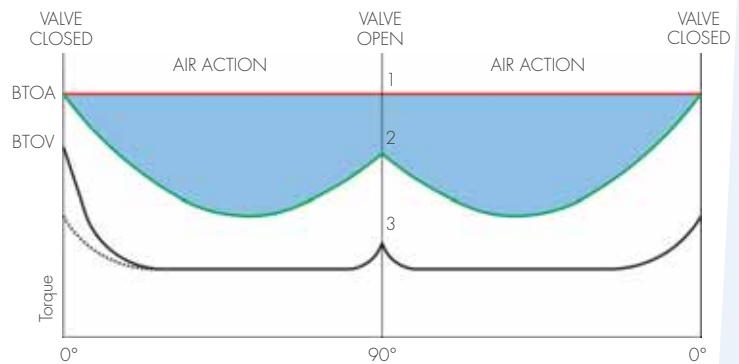
## ENERGY SAVING SYSTEM

### DOUBLE ACTING GD

The diagram shows the torques development during the valve cycle from closed to open and closed again.

- 1: Rack & Pinion flat torque,
- 2: Scotch Yoke canted torque,
- 3: Represent the typical valve torque.

The blue area between the Rack & Pinion and Scotch Yoke diagrams shows the Motive Energy Saving, easily verified comparing the compressed air consumption stated in our data table and any Rack & Pinion manufacturer.

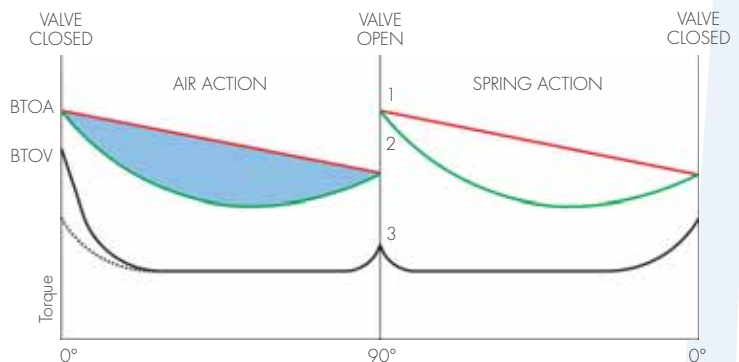


### SPRING RETURN GS

The diagram shows the torques development during the valve cycle from closed to open and closed again.

- 1: Rack & Pinion flat torque,
- 2: Scotch Yoke canted torque,
- 3: Represent the typical valve torque.

The blue area between the Rack & Pinion and Scotch Yoke diagrams shows the Motive Energy Saving, easily verified comparing the compressed air consumption stated in our data table and any Rack & Pinion manufacturer.



BTOV: Break Torque to Open Valve;  
 BTOA: Break Torque to Open Actuator;  
**BTOA = BTOV+SF ( Safety Factor ).**

## Double Acting Actuators Torque table, Nm

ACTUATOR SIZE	ROTATION ANGLE 0° VALVE CLOSED 90° VALVE OPEN	Air pressure supply in bar							
		2,5	3	4	5	5,6	6	7	8
GD8	0°	3,1	3,8	5,0	6,3	7,0	7,5	8,8	10,0
	45°	1,6	1,9	2,5	3,1	3,5	3,8	4,4	5,0
	90°	3,1	3,8	5,0	6,3	7,0	7,5	8,8	10,0
GD15	0°	6,7	8,0	10,7	13,4	15,0	16,1	18,8	21,4
	50°	3,3	4,0	5,4	6,7	7,5	8,0	9,4	10,7
	90°	5,0	6,1	8,1	10,1	11,3	12,1	14,1	16,1
GD30	0°	13,4	16,1	21,4	26,8	30,0	32,1	37,5	42,9
	50°	6,7	8,0	10,7	13,4	15,0	16,1	18,8	21,4
	90°	10,0	12,1	16,1	20,1	22,5	24,1	28,1	32,1
GD60	0°	26,8	32,1	42,9	53,6	60,0	64,3	75,0	85,7
	50°	13,4	16,1	21,4	26,8	30,0	32,1	37,5	42,9
	90°	20,1	24,1	32,1	40,2	45,0	48,2	56,3	64,3
GD106	0°	47,3	56,8	75,7	94,6	106,0	113,6	132,5	151,4
	50°	23,7	28,4	37,9	47,3	53,0	56,8	66,3	75,7
	90°	35,7	42,9	57,1	71,4	80,0	85,7	100,0	114,3
GD180	0°	80,4	96,4	128,6	160,7	180,0	192,9	225,0	257,1
	50°	40,2	48,2	64,3	80,4	90,0	96,4	112,5	128,6
	90°	60,3	72,3	96,4	120,5	135,0	144,6	168,8	192,9
GD240	0°	107,1	128,6	171,4	214,3	240,0	257,1	300,0	342,9
	50°	53,6	64,3	85,7	107,1	120,0	128,6	150,0	171,4
	90°	80,4	96,4	128,6	160,7	180,0	192,9	225,0	257,1
GD360	0°	160,7	192,9	257,1	321,4	360,0	385,7	450,0	514,3
	50°	80,4	96,4	128,6	160,7	180,0	192,9	225,0	257,1
	90°	120,5	144,6	192,9	241,1	270,0	289,3	337,5	385,7
GD480	0°	214,3	257,1	342,9	428,6	480,0	514,3	600,0	685,7
	50°	107,1	128,6	171,4	214,3	240,0	257,1	300,0	342,9
	90°	160,7	192,9	257,1	321,4	360,0	385,7	450,0	514,3
GD720	0°	321,4	385,7	514,3	642,9	720,0	771,4	900,0	1028,6
	50°	160,7	192,9	257,1	321,4	360,0	385,7	450,0	514,3
	90°	241,1	289,3	385,7	482,1	540,0	578,6	675,0	771,4
GD960	0°	428,6	514,3	685,7	857,1	960,0	1028,6	1200,0	1371,4
	50°	214,3	257,1	342,9	428,6	480,0	514,3	600,0	685,7
	90°	321,4	385,7	514,3	642,9	720,0	771,4	900,0	1028,6
GD1440	0°	642,9	771,4	1028,6	1285,7	1440,0	1542,9	1800,0	2057,1
	50°	321,4	385,7	514,3	642,9	720,0	771,4	900,0	1028,6
	90°	482,1	578,6	771,4	964,3	1080,0	1157,1	1350,0	1542,9
GD1920	0°	857,1	1028,6	1371,4	1714,3	1920,0	2057,1	2400,0	2742,9
	50°	428,6	514,3	685,7	857,1	960,0	1028,6	1200,0	1371,4
	90°	642,9	771,4	1028,6	1285,7	1440,0	1542,9	1800,0	2057,1
GD2880	0°	1285,7	1542,9	2057,1	2571,4	2880,0	3085,7	3600,0	4114,3
	50°	642,9	771,4	1028,6	1285,7	1440,0	1542,9	1800,0	2057,1
	90°	964,3	1157,1	1542,9	1928,6	2160,0	2314,3	2700,0	3085,7
GD3840	0°	1714,3	2057,1	2742,9	3428,6	3840,0	4114,3	4800,0	5485,7
	50°	857,1	1028,6	1371,4	1714,3	1920,0	2057,1	2400,0	2742,9
	90°	1285,7	1542,9	2057,1	2571,4	2880,0	3085,7	3600,0	4114,3
GD5760	0°	2571,4	3085,7	4114,3	5142,9	5760,0	6171,4	7200,0	8228,6
	50°	1285,7	1542,9	2057,1	2571,4	2880,0	3085,7	3600,0	4114,3
	90°	1928,6	2314,3	3085,7	3857,1	4320,0	4628,6	5400,0	6171,4
GD8000	0°	3571,4	4285,7	5714,3	7142,9	8000,0	8571,4	10000,0	-
	50°	1785,7	2142,9	2857,1	3571,4	4000,0	4285,7	5000,0	-
	90°	2678,6	3214,3	4285,7	5357,1	6000,0	6428,6	7500,0	-



# Double Acting Actuators GD

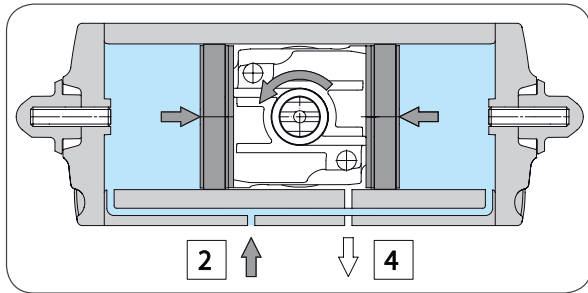
GD8 - GD1920



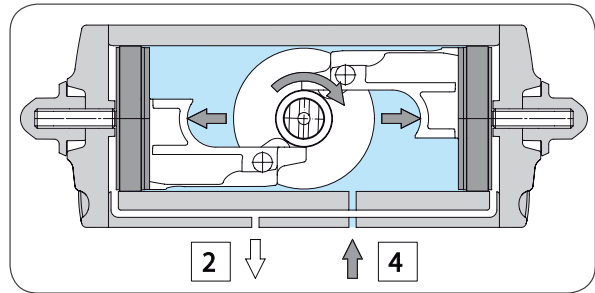
GD2880 - GD8000



OPEN POSITION VALVE



CLOSED POSITION VALVE

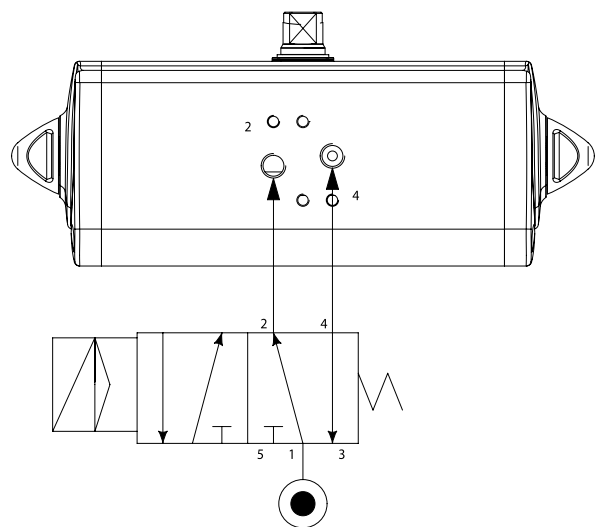


## AIR CONNECTION SCHEMA

The port 2 is in connection with the cylinder side chambers, supplying the pressurised air in port 2 the standard Double Acting actuator drive shaft rotates counter clockwise to open, while the port 4 is in connection with the intermediate chamber and when pressurised the drive shaft rotates clockwise to close.

Actuator operation functionality remote control should be done by means of direct solenoid valve connection to the actuator standard interface VDE/VDI 3845 NAMUR, or by means of pipes screwed on the ports marked with the numbers 2 and 4 and connected to a separate control cabinet.

In accordance with the international standard ISO 5599-2 the actuator air ports connection position, location, orientation and form shall be clearly identified and market with the numerate 2 and 4.





## Operating time 5.6 bar

SIZE	Opening time Sec.	Closing time Sec.	Cycle time Sec.
GD0008	0,03	0,03	0,06
GD0015	0,04	0,04	0,08
GD0030	0,06	0,07	0,13
GD0060	0,10	0,11	0,21
GD0106	0,20	0,21	0,41
GD0180	0,32	0,31	0,63
GD0240	0,41	0,40	0,81
GD0360	0,60	0,58	1,18
GD0480	0,78	0,76	1,54

SIZE	Opening time Sec.	Closing time Sec.	Cycle time Sec.
GD0720	1,00	1,10	2,10
GD0960	1,50	1,60	3,10
GD1440	2,30	2,40	4,70
GD1920	3,10	3,20	6,30
GD2880	4,50	4,50	9,00
GD3840	6,00	6,00	12,00
GD5760	8,00	8,00	16,00
GD8000	11,00	11,00	22,00

The operating time can be reduced on demand.

## Weight

SIZE	Weight Kg.
GD0008	0,30
GD0015	0,75
GD0030	1,00
GD0060	1,60
GD0106	2,50
GD0180	4,60

SIZE	Weight Kg.
GD0240	5,40
GD0360	6,50
GD0480	9,60
GD0720	12,00
GD0960	17,40
GD1440	23,40

SIZE	Weight Kg.
GD1920	32,00
GD2880	56,00
GD3840	52,00
GD5760	86,00
GD8000	106,00

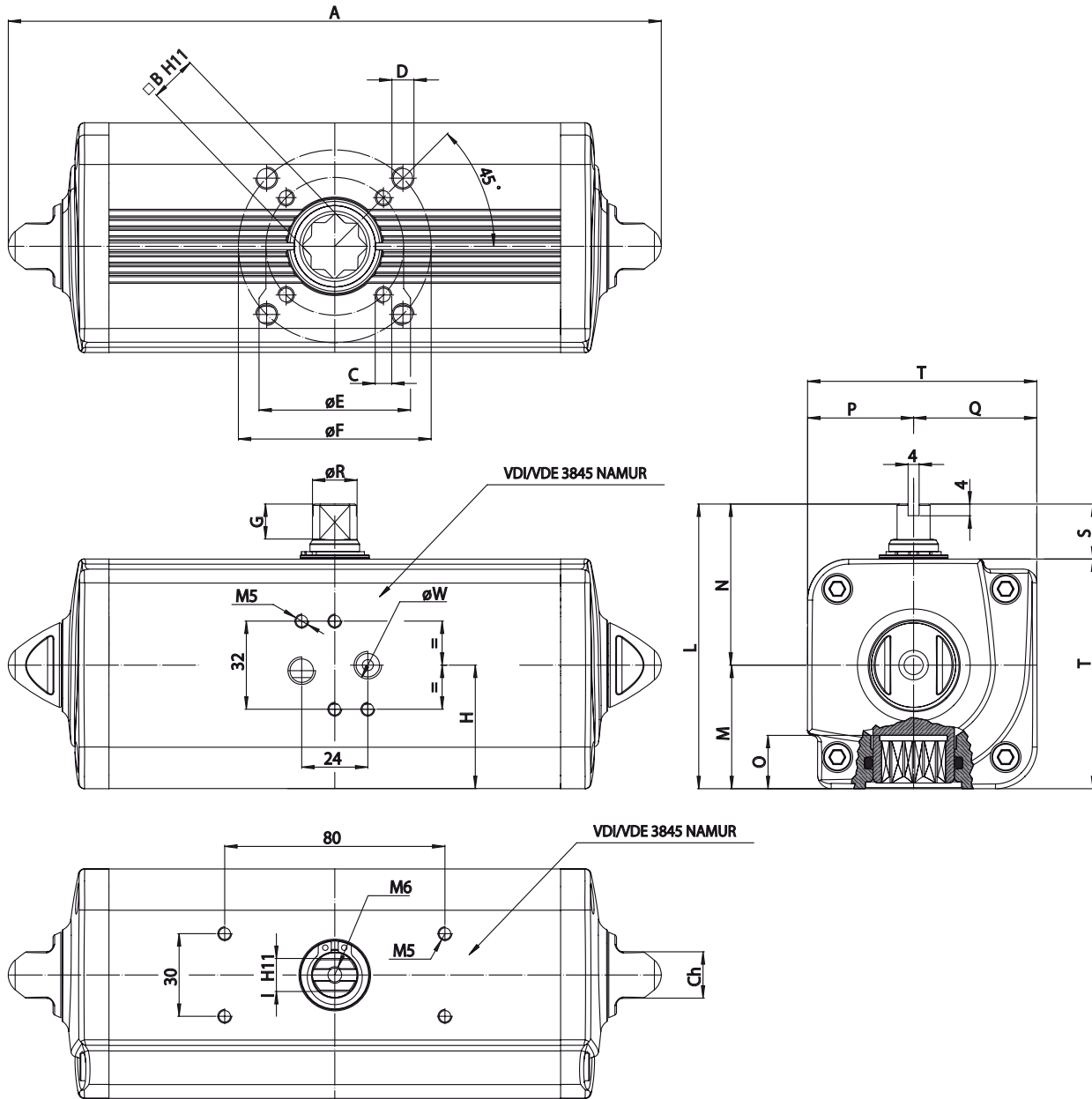
## Air consumption

SIZE	Air consumption dm <sup>3</sup> /cycle (l/cycle)
GD0008	0,03
GD0015	0,08
GD0030	0,15
GD0060	0,30
GD0106	0,55
GD0180	0,95

SIZE	Air consumption dm <sup>3</sup> /cycle (l/cycle)
GD0240	1,30
GD0360	1,80
GD0480	2,60
GD0720	3,50
GD0960	4,90
GD1440	7,60

SIZE	Air consumption dm <sup>3</sup> /cycle (l/cycle)
GD1920	10,20
GD2880	20,00
GD3840	25,60
GD5760	38,00
GD8000	50,00

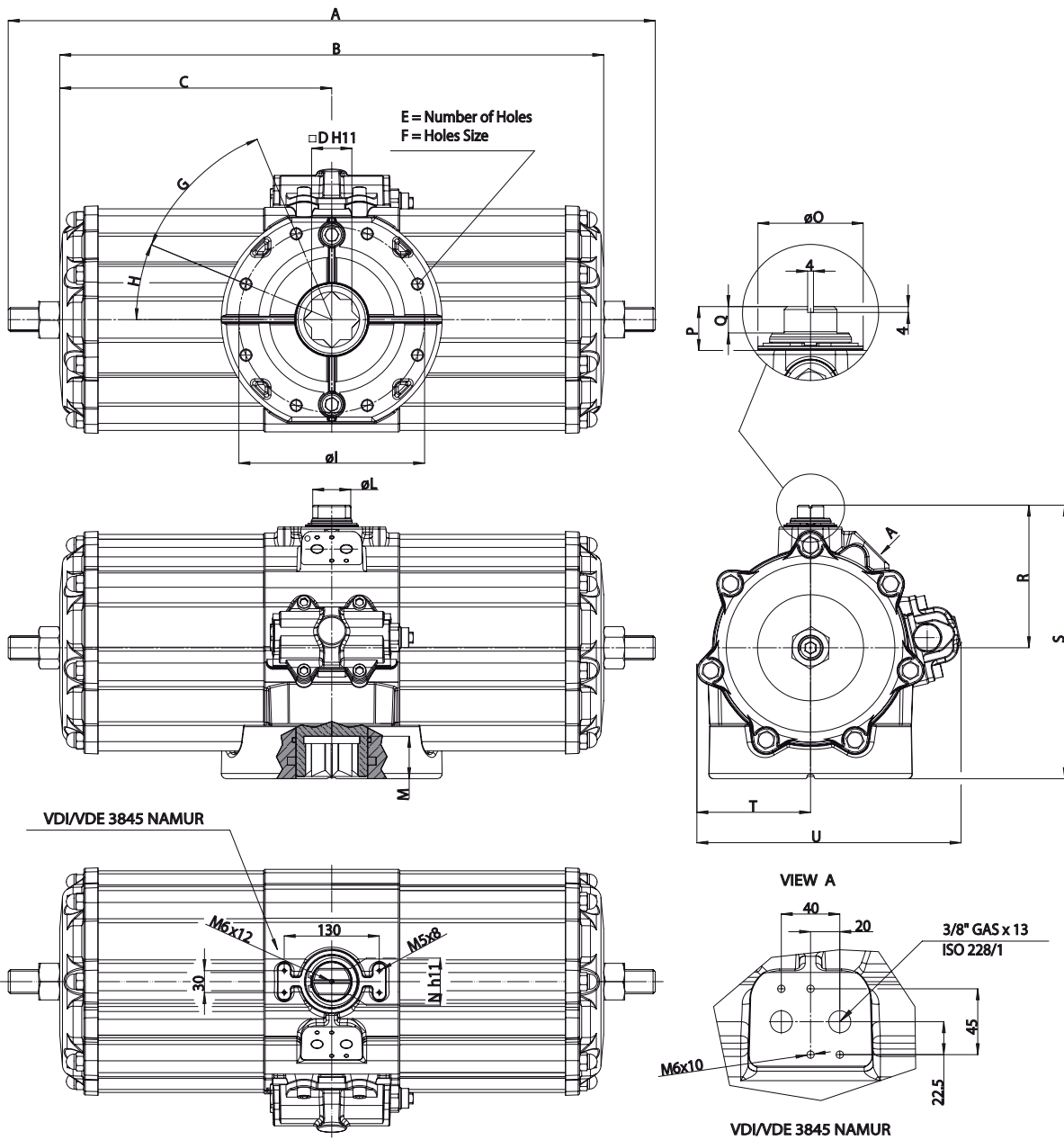
# Double Acting dimensions GD8 – GD1920



\*All dimensions are in mm.

TYPE	GD08	GD15	GD30	GD60	GD106	GD180	GD240	GD360	GD480	GD720	GD960	GD1440	GD1920							
ISO	F03	F03	F04	F03/F05	F04	F04	F05/F07	F05/F07	F07/F10	F07/F10	F07/F10	F10/F12	F10/F12	F10/F12	F12	F14	F12/F16	F14		
A	70	159,1	159,1	174,3	174,3	198,1	198,1	237,1	289,9	313,6	339,3	387,7	433	479,4	479,4	567	567	601	601	
B	9	11	11	11	11	14	14	17	22	22	22	27	27	36	36	36	36	46	46	
C x depth	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M6x9	M6x9	M8x12	M8x12	M8x12	M10x15	M10x15	M10x15	M10x15	M16x24	M12x18	M16x24	M12x18	M16x24
D x depth	-	-	-	M6x9	-	-	M8x12	M8x12	M10x15	M10x15	M10x15	M12x18	M12x18	M12x18	-	-	-	M20x30	-	
E	36	36	42	36	42	42	50	50	70	70	70	102	102	102	102	140	125	140	125	140
F	-	-	-	50	-	-	70	70	102	102	102	125	125	125	-	-	-	165	-	
G	8	10	10	10	10	13	13	13	16	17	19	19	19,5	19,5	19,5	19,5	19,5	18,5	18,5	
H	-	26,8	26,8	30,3	30,3	35,7	35,7	42,8	54,5	58,1	60	57,4	61,5	78	78	86,5	86,5	99,2	99,2	
I	8	8	8	9	9	10	10	12	15	15	19	19	22	24	24	27	27	32	32	
L	57,7	72,2	72,2	79,2	79,2	90,4	90,4	103,3	137,5	141,1	148	164,9	178	198	198	216	216	237,7	237,7	
M	22,7	28	28	31,5	31,5	37,7	37,7	44,8	56,5	60,1	62	72,9	78,5	93,5	93,5	101,5	101,5	114,7	114,7	
N	35	44,2	44,2	47,7	47,7	52,7	52,7	58,5	81	81	86	92	99,5	104,5	104,5	114,5	114,5	123	123	
O	10,1	13,2	13,2	13,2	13,2	16,5	16,5	19,3	24,8	24,8	24,3	29,5	29,5	38,5	38,5	38,5	38,5	48,5	48,5	
P	20	24,2	24,2	27,7	27,7	32,7	32,7	38,5	51	51	56	62	69,5	74,5	74,5	84,5	84,5	93	93	
Q	23,2	28	28	31,5	31,5	37,7	37,7	44,8	56,5	60,1	62	72,9	78,5	93,5	93,5	101,5	101,5	114,7	114,7	
R	9,2	9,2	9,2	10,9	10,9	14,5	14,5	16,2	20,2	22,5	25,5	29	31,8	36,5	36,5	41	41	46	46	
S	15	20	20	20	20	20	20	20	30	30	30	30	30	30	30	30	30	30	30	
T	-	52,2	52,2	59,2	59,2	70,4	70,4	83,3	107,5	111,1	118	134,9	148	168	168	186	186	207,7	207,7	
W (Gas)	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	
Ch	-	13	13	13	13	13	13	17	22	22	22	27	27	27	27	36	36	36	36	

# Double Acting dimensions GD2880 – GD8000



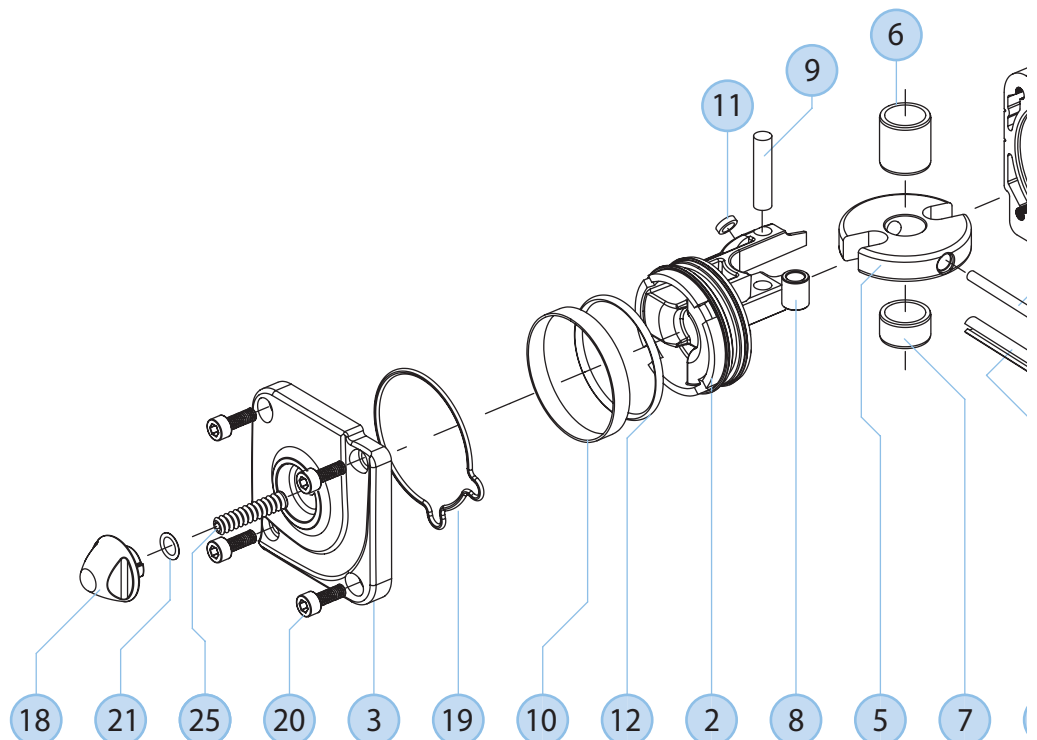
\*All dimensions are in mm.

TYPE	GD2880	GD3840	GD5760	GD8000
ISO	F16	F16	F25	F25
A	667	765	885	1044
B	560	651	744	877
C	188	325,5	372	438,5
D	46	46	55	55
E	4	4	8	8
F x depth	M20x 30	M20x 30	M16x24	M16x24
G	90°	90°	45°	45°
H	45°	45°	22,5°	22,5°
I	165	165	254	254
L	52	46	52	52
M	48,5	48,5	58	58
N	36	32	36	36
O	72	62	72	72
P	30	30	30	30
Q	18	18,5	18	18
R	195	166	195	195
S	359	314,5	374	374
T	155,5	120	155	188
U	311	298	361	394

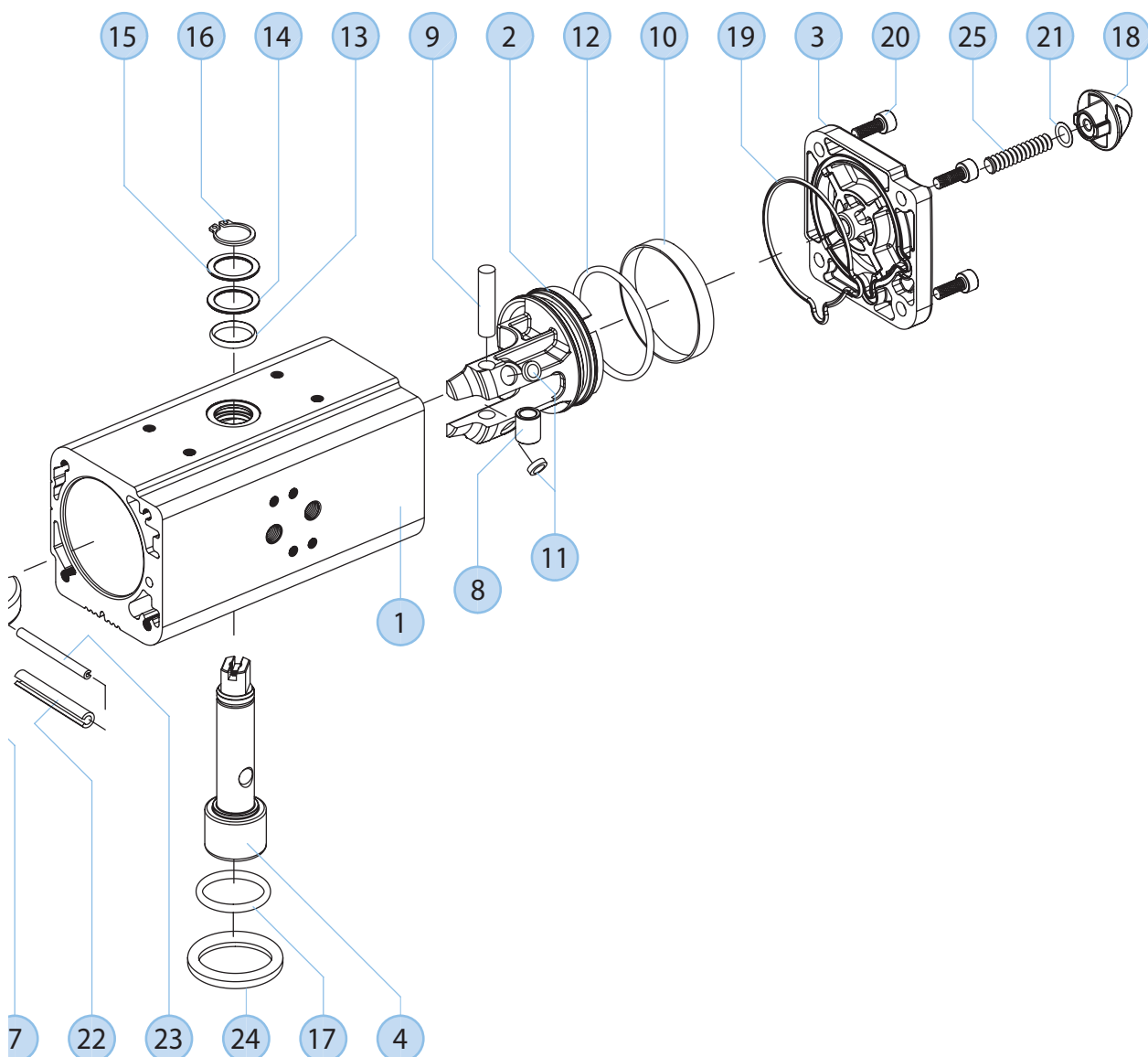
## Double Acting part list GD15 – GD1920

(for GD08 – GD2880 – GD3840 – GD5760 – GD8000 part list, see the specific datasheet)

Pos	Denomination	Quantity	Materials
1	Cylinder	1	Aluminium alloy
2	Piston	2	Aluminium alloy
3	Cap	2	Aluminium alloy
4	Shaft	1	Stainless steel
5	Scotch yoke	1	Steel alloy
6	Support bush	1	Acetalic resin
7	Shaft support	1	Acetalic resin
8	Bush	2	Steel alloy
9	Rotative sleeve	2	Steel alloy
10	Dynamic seal (piston)	2	Polyurethane
11	Piston's support	4	P.T.F.E. Carbo-graphite filled
12	Piston's o-ring	2	Nitrilic rubber
13	O-ring (upper sealing shaft)	1	Fkm



Pos	Denomination	Quantity	Materials
14	External support ring	1	Acetalic resin
15	Washer	1	Stainless steel
16	Seeger	1	Stainless steel
17	O-ring (lower sealing shaft)	1	Fkm
18	Nut	2	Aluminium alloy
19	Cap's o-ring	2	Nitrilic rubber
20	Screw	8	Stainless steel
21	O-ring	2	Nitrilic rubber
22	External elastic pin of the yoke	1	Steel alloy
23	Internal elastic pin of the yoke	1	Steel alloy
24	Centering ring (optional)	1	Aluminium alloy
25	Stroke adjustment screw	2	Stainless steel



## Spring Return Actuators GS

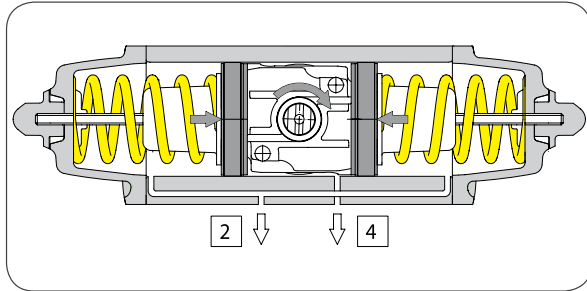
GS15 - GS960



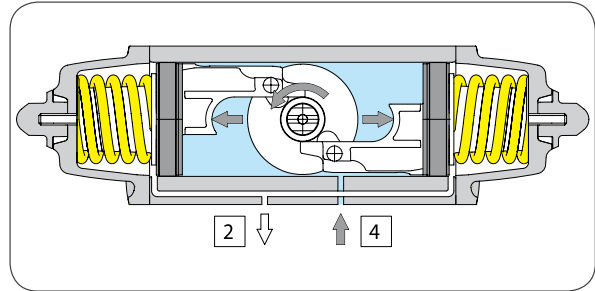
GS1440 - GS4000



CLOSED POSITION VALVE



OPEN POSITION VALVE



### AIR CONNECTION SCHEMA

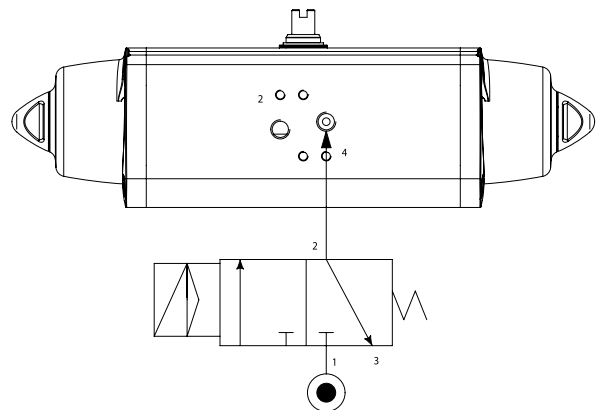
Single Acting, Spring Return fail to Close.

The pistons of standard GS actuators are mounted as shown above. Although spring force is diminished, the geometry of the mechanism provides a greater torque at the end of the spring stroke. When the actuator is in the valve open position, and the springs are fully compressed, the end of travel stops can be fine adjusted. Spring Return Fail to Open actuators are required when in case of the pressurised air or electrical power supply are off the valve should be automatically opened.

In the fail to open actuators the pistons are inserted into the cylinder like the Double acting version, and due to the spring force the actuator is Normally Open.

**Attention.** Nominal torque and torque performances in Spring Return Fail to Open version, due to its construction, are different from the Spring Return Fail to Close standard version.

**Caution.** In order to avoid suction of dust or dirt inside of the actuator chambers during the spring action, install a filter on the port 2. The port 4 is in connection with the intermediate chamber and when pressurised the drive shaft rotate counter clockwise to open. In accordance with the international standard ISO 5599-2 the actuator air ports connection position, location, orientation and form shall be clearly identified and market with the numerate 2 and 4.



## Operating time 5.6 bar

SIZE	Opening time Sec.	Closing time Sec.	Cycle time Sec.
GS0015	0,11	0,13	0,24
GS0030	0,23	0,27	0,50
GS0053	0,41	0,48	0,89
GS0090	0,60	0,70	1,30
GS0120	0,79	0,92	1,71
GS0180	1,29	1,41	2,70
GS0240	1,50	1,70	3,20
GS0360	1,70	1,90	3,60

SIZE	Opening time Sec.	Closing time Sec.	Cycle time Sec.
GS0480	1,80	2,00	3,80
GS0720	2,20	2,50	4,70
GS0960	2,90	3,40	6,30
GS1440	5,00	6,00	11,00
GS1920	7,00	8,00	15,00
GS2880	9,00	11,00	20,00
GS4000	12,00	13,00	25,00

The operating time can be reduced on demand.

## Weight

SIZE	Weight Kg.
GS0015	1,20
GS0030	1,95
GS0053	3,00
GS0090	5,90
GS0120	6,80

SIZE	Weight Kg.
GS0180	8,90
GS0240	11,80
GS0360	16,50
GS0480	22,70
GS0720	33,00

SIZE	Weight Kg.
GS0960	42,00
GS1440	74,00
GS1920	70,00
GS2880	117,00
GS4000	183,00

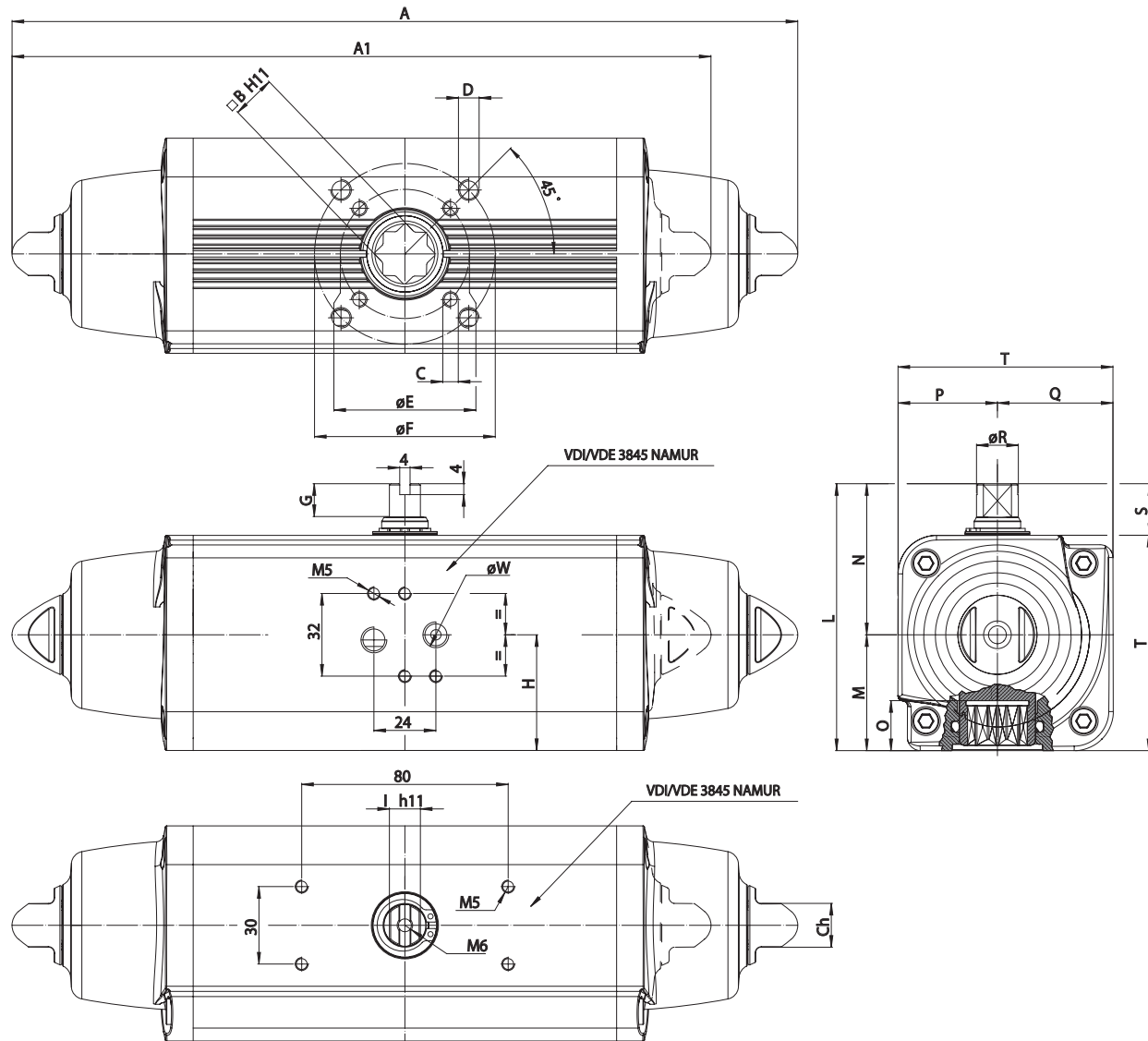
## Air consumption

SIZE	Air consumption dm <sup>3</sup> /cycle (l/cycle)
GS0015	0,09
GS0030	0,17
GS0053	0,30
GS0090	0,55
GS0120	0,80

SIZE	Air consumption dm <sup>3</sup> /cycle (l/cycle)
GS0180	1,00
GS0240	1,50
GS0360	2,00
GS0480	2,80
GS0720	4,20

SIZE	Air consumption dm <sup>3</sup> /cycle (l/cycle)
GS0960	5,90
GS1440	11,00
GS1920	13,10
GS2880	21,00
GS4000	29,10

# Spring Return Dimensions GS15 – GS960

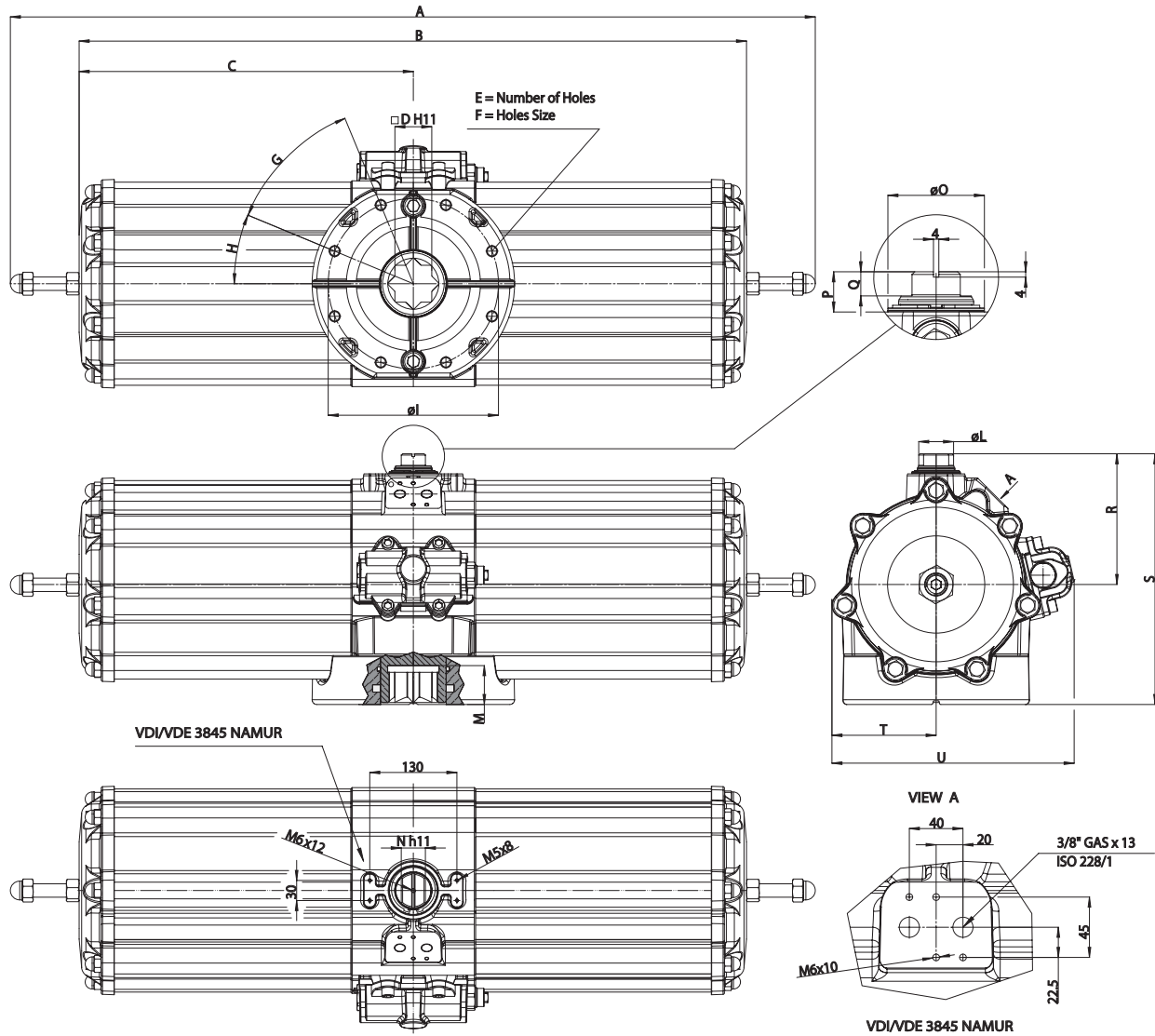


\*All dimensions are in mm.

TYPE	GS15		GS30		GS53	GS90	GS120	GS180	GS240	GS360	GS480		GS720		GS960	
ISO	F03/F05	F04	F04	F05/F07	F05/F07	F07/F10	F07/F10	F07/F10	F10/F12	F10/F12	F10/F12	F14	F12	F14	F12/F16	F14
A	233,3	233,3	259	259	304,3	393,7	409,6	474	520,5	613	648,2	648,2	798	798	828	828
A1 (2,8 Bar)	203,8	203,8	228,5	228,5	270,7	341,8	361,6	406,6	454,1	523	563,8	563,8	683	683	714,4	714,4
B	11	11	14	14	17	22	22	22	27	27	36	36	36	36	46	46
C x depth	M5x8	M5x8	M5x8	M6x9	M6x9	M8x12	M8x12	M8x12	M10x15	M10x15	M10x15	M16x24	M12x18	M16x24	M12x18	M16x24
D x depth	M6x9	-	-	M8x12	M8x12	M10x15	M10x15	M10x15	M12x18	M12x18	M12x18	-	-	-	M20x30	-
E	36	42	42	50	50	70	70	70	102	102	102	140	125	140	125	140
F	50	-	-	70	70	102	102	102	125	125	125	-	-	-	165	-
G	10	10	13	13	13	16	17	19	19	19,5	19,5	19,5	19,5	19,5	18,5	18,5
H	30,3	30,3	35,7	35,7	42,8	54,5	58,1	60	57,4	61,5	78	78	86,5	86,5	99,2	99,2
I	9	9	10	10	12	15	15	19	19	22	24	24	27	27	32	32
L	79,2	79,2	90,4	90,4	103,3	137,5	141,1	148	164,9	178	198	198	216	216	237,7	237,7
M	31,5	31,5	37,7	37,7	44,8	56,5	60,1	62	72,9	78,5	93,5	93,5	101,5	101,5	114,7	114,7
N	47,7	47,7	52,7	52,7	58,5	81	81	86	92	99,5	104,5	104,5	114,5	114,5	123	123
O	13,2	13,2	16,5	16,5	19,3	24,8	24,8	24,3	29,5	29,5	38,5	38,5	38,5	38,5	48,5	48,5
P	27,7	27,7	32,7	32,7	38,5	51	51	56	62	69,5	74,5	74,5	84,5	84,5	93	93
Q	31,5	31,5	37,7	37,7	44,8	56,5	60,1	62	72,9	78,5	93,5	93,5	101,5	101,5	114,7	114,7
R	10,9	10,9	14,5	14,5	16,2	20,2	22,5	25,5	29	31,8	36,5	36,5	41	41	46	46
S	20	20	20	20	20	30	30	30	30	30	30	30	30	30	30	30
T	59,2	59,2	70,4	70,4	83,3	107,5	111,1	118	134,9	148	168	168	186	186	207,7	207,7
W (Gas)	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
Ch	13	13	13	13	17	22	22	22	27	27	27	27	36	36	36	36



# Spring Return Dimensions GS1440 – GS4000



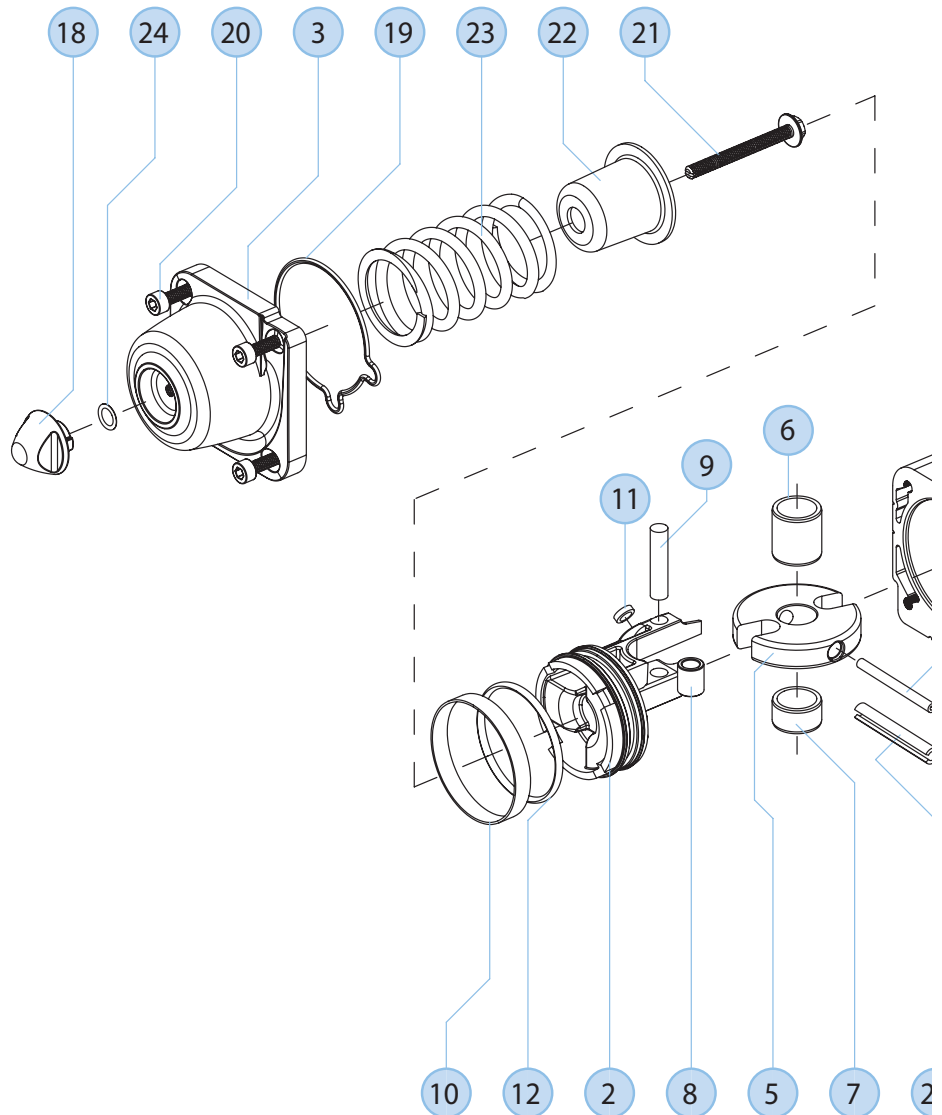
\*All dimensions are in mm.

TYPE	GS1440	GS1920	GS2880	GS4000
ISO	F16	F16	F16	F25
A	834	1001	1201	1370
B	686	857	996	1184
C	188	428,5	498	592
D	46	46	46	55
E	4	4	4	8
F x depth	M20 x 30	M20 x 30	M20 x 30	M16 x 24
G	90°	90°	90°	45°
H	45°	45°	45°	22,5°
I	165	165	165	254
L	52	46	52	52
M	48,5	48,5	48,5	58
N	36	32	36	36
O	72	62	72	72
P	30	30	30	30
Q	18	18,5	18	18
R	195	166	195	195
S	359	314	359	374
T	155,5	120	155,5	188
U	311	298	361	394

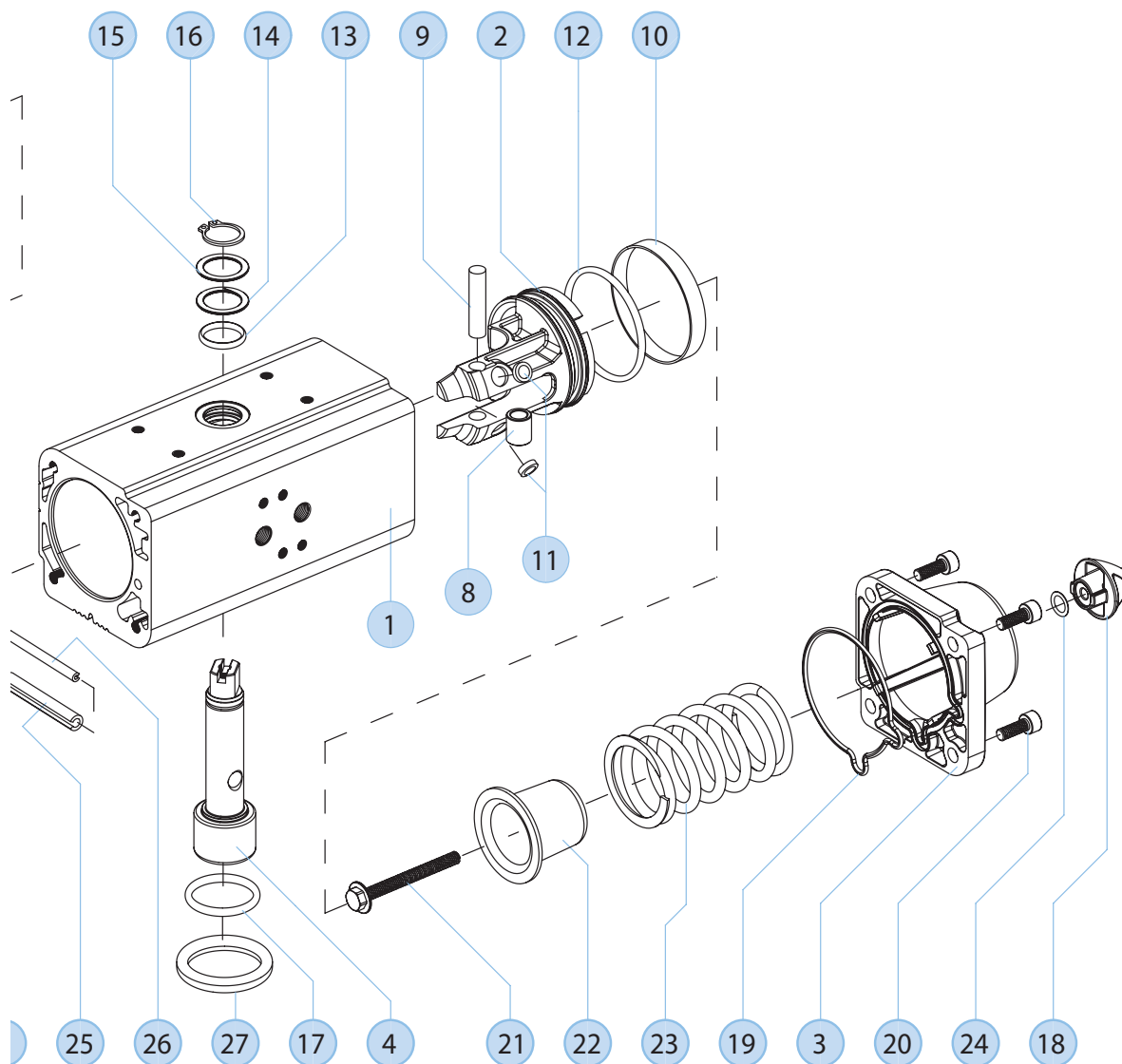
# Spring Return part list GS15 – GS960

(for GS1440 – GS1920 – GS2880 – GS4000 part list, see the specific datasheet)

Pos	Denomination	Quantity	Materials
1	Cylinder	1	Aluminium alloy
2	Piston	2	Aluminium alloy
3	Cap	2	Aluminium alloy
4	Shaft	1	Stainless steel
5	Scotch yoke	1	Steel alloy
6	Support bush	1	Acetalic resin
7	Shaft support	1	Acetalic resin
8	Bush	2	Steel alloy
9	Rotative sleeve	2	Steel alloy
10	Dynamic seal (piston)	2	Polyurethane
11	Piston's support	4	P.T.F.E. Carbo-graphite filled
12	Piston's o-ring	2	Nitrilic rubber
13	O-ring (upper sealing shaft)	1	Fkm
14	External support ring	1	Acetalic resin



Pos	Denomination	Quantity	Materials
15	Washer	1	Stainless steel
16	Seeger	1	Stainless steel
17	O-ring (lower sealing shaft)	1	Fkm
18	Nut	2	Aluminium alloy
19	Cap's o-ring	2	Nitrilic rubber
20	Screw	8	Stainless steel
21	Spring loading screw	2	Stainless steel
22	Spring cap	2	Steel alloy
23	Spring	2	Steel alloy
24	O-ring	2	Nitrilic rubber
25	External elastic pin of the yoke	1	Steel alloy
26	Internal elastic pin of the yoke	1	Steel alloy
27	Centering ring (optional)	1	Aluminium alloy





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